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Tar Heel

JUNIOR HISTORIAN

North Carolina History for Students

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exploring the air: pioneers of aviation

Fall 2003 *Produced by the North Carolina Museum of History*

Tar Heel Junior Historian Association

Tar Heel Junior Historian

North Carolina History for Students

Fall 2003 Volume 43, Number 1

On the cover: (left to right, top row) *Tiny Broadwick; the first flight; hang gliding;* (bottom row) *William Lee; a Piedmont Boeing 737; Vernon Haywood. Screened image of the 1902 flyer in background.*

Contents

1 Introduction: Aviation in North Carolina, 1873–2003
by Dr. Thomas C. Parramore

4 The Wright Brothers in North Carolina
by Stephen Kirk

8 Flying the Unfriendly Skies: North Carolinians in the Two World Wars
by Tom Belton

12 Tiny Broadwick: The First Lady of Parachuting
by Elizabeth Whitley Roberson

14 Touching Base with a Tuskegee Airman
by Doris McLean Bates

16 North Carolina's Contributions to Aviation: A Photographic Essay
by Rebecca Lewis

18 *Tar Heel Junior Historian* Essay Contest

20 Piedmont Airlines Flies the Blue Skies
by Walter R. Turner

22 Wheeler Airlines: An American First
by Charles W. Wadelington

24 A North Carolina WASP
by Sandra O. Boyd

26 Tar Heels in Space
by Jim Sumner

29 Lindbergh's Influence on Aviation
by RoAnn Bishop

32 "The Greatest Pilot on Earth"
by Dr. Thomas C. Parramore

34 Flight of the Imagination
by Rebecca Lewis

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Orville Wright pilots the flyer as brother Wilbur looks on. Lifesaver John T. Daniels took this famous photograph of the first flight. *Courtesy of Library of Congress.*

Introduction

Aviation in North Carolina, 1873–2003

*by Dr. Thomas C. Parramore**

Few people know it, but North Carolina has played a big part in aviation. The first American airplane was built here in 1873. The first heavier-than-air, powered flight took place in North Carolina one hundred years ago, in 1903, and the first helicopter to fly got off the ground here in 1907. These are only a few of the gifts our state has made to aviation.

In World War I, one of the best flyers was Kiffin Rockwell of Asheville. In 1916 he helped to organize the Lafayette Escadrille, a squadron of planes flown by American airmen for service with the French army. In their first action, Rockwell became the first American to shoot down an enemy plane. The Escadrille made world headlines and helped to bring the United States into the war in 1917.

Have you seen any of the Hollywood movies that celebrate Tar Heel airmen for their deeds in World War II? Among the best, *Twelve O'Clock High* tells about Frank Armstrong of Hobgood, with Gregory Peck playing Armstrong's role. Even better is *The Great Escape,* featuring Goldsboro's John D. Lewis, played by Steve McQueen. *Memphis Belle* honors Asheville pilot Robert Morgan and his World War II bomber of that name. *The Lafayette Escadrille* recounts the World War I flying career of James Baugham of Washington, North Carolina. A less well-known movie tells the story of George Preddy of Greensboro, who shot down six German planes in five minutes over Berlin in 1944—an amazing feat.

American pilots in France during World War I. *Courtesy of North Carolina State Archives.*

Dr. Thomas C. Parramore, a professor emeritus of history from Meredith College in Raleigh, wrote the book First to Fly: North Carolina and the Beginnings of Aviation, *published in 2002 by the University of North Carolina Press.*

Artist's rendering of James Henry Gatling and his monoplane at the Gatling family farm. *Courtesy of North Carolina State Archives.*

The first American airplane was built by farmer James Henry Gatling of Hertford County. It was an odd-looking, hand-powered machine with wings, propellers, and other features of modern planes. (Its builder was an older brother of Richard J. Gatling, inventor of the first successful machine gun, the Gatling gun.) In his attempt to fly in 1873, Henry Gatling crashed after the aircraft glided nearly one hundred feet. He was not badly hurt. The town of Murfreesboro, near Gatling's farm, has built a full-size replica of the plane and exhibits it around the state.

One of America's first dirigibles was built at Winston-Salem in 1902 by tenant farmer Jake Hill. A dirigible, or airship, is a lighter-than-air craft. Hill's version didn't fly.

Luther Paul of Carteret County built his helicopter, called the *Bumble Bee*, in 1907. Its power came from four motorcycle engines. It rose only a few feet, but it was the world's first machine to lift itself straight up off the ground. The North Carolina Maritime Museum at Beaufort has a model of the *Bumble Bee.*

Dr. W. W. Christmas, a Warrenton native, claimed in 1912 to be the first American after the Wright brothers to build and fly his own airplane in 1908. But he also made many other such claims, most of which, like this one, turned out to be false or at least doubtful. Christmas was in some ways a genius, but he may have been the greatest liar in aviation history.

When the Wright brothers began experimenting with their glider at Kitty Hawk in the year 1900, they had all kinds of help from local Outer Bankers. The Bankers helped to assemble the Wrights' gliders after they were shipped in crates from Dayton, Ohio, the brothers' home. Outer Bankers ran errands, sailed the brothers back and forth across the sound between Kitty Hawk and Elizabeth City, dug wells, constructed buildings, and helped to get the gliders into the air. On each effort, the machine had to be carried up steep, slippery Kill Devil Hill—and the brothers made hundreds of efforts.

When Orville Wright flew his first airplane in 1903, four Outer Bankers helped it make a good start. Another, John T. Daniels, took the remarkable photo of the plane's takeoff (see page 1). There would have been no airplane flight in 1903 without these helpers.

Tiny Broadwick in her first jump from a hydroplane into Lake Michigan in 1913. *Courtesy of North Carolina State Archives.*

Postcard of the Wright Brothers National Memorial Monument, ca. 1942. The monument, a sixty-foot-high pylon made of Mount Airy granite, was completed and dedicated in November 1932.

In 1927 Congress passed a bill for the American government to build a handsome monument on Kill Devil Hill to honor the Wrights. Five years later, the project was finished. Before then, few people had ever thought of visiting the area. There were no roads, bridges, hotels, or other things tourists needed, but soon all that changed. After 1932 tourists began to come in large numbers to visit the Wright memorial. Real-estate salesmen found it easy to sell cottages and lots to summer vacationers. The Outer Banks area became nationally known for its beautiful beaches and oceanside attractions, as well as for the Wright memorial.

World War I forced many nations to spend fortunes building airplanes, resulting in a quick improvement in their usefulness. Gradually, as planes continued to improve after the war, North Carolina began to enjoy airplane passenger service, fast shipping of goods and mail by air, and more. Barnstormers, men and women who gave air shows across the state, built a large following of people who came to watch hair-raising stunts.

Other Tar Heels learned to fly and became instructors for pilots. Charles A. Lindbergh, the first person to fly alone across the Atlantic Ocean, received some of his aviation training in 1924 in Texas, where his teacher was Lieutenant William Winston from Wendell.

Pope Airfield, a large army base, was built near Fayetteville after World War I, and another, Seymour Johnson Air Base at Goldsboro, was constructed for use in World War II. Both remain very important to the defense of our country. Still another air base was the huge blimp, or dirigible, field at Weeksville, which built blimps in World War II to watch the coast for enemy submarines.

More recently, North Carolina has been important to the American space program. The second head of the National Aeronautics and Space Administration (NASA) was James E. Webb of Granville County. Several Tar Heels have become astronauts. Such men and women get some of their training in astronomy at Morehead Planetarium on the campus of the University of North Carolina at Chapel Hill.

Women and African Americans have contributed much to aviation in North Carolina and in the nation. In 1913 Georgia "Tiny" Broadwick of Henderson became the first woman to parachute from a plane. Viola Gentry of Rockingham County learned to fly in 1924. She was the first North Carolina woman to win a pilot's license, which she earned in New York, where she resided at the time. Five years later, she set a world record for most time spent in the air on a single flight: eight hours, six and a half minutes. Mary Nicholson of Greensboro was apparently the first American woman to die in an army plane in World War II; she perished in an accident in England.

Raleigh native Colonel Vernon Haywood, a former Tuskegee Airman, conducts a mission briefing at Williams Air Force Base in the 1950s. *Courtesy of Pima Air and Space Museum, Tucson, Arizona.*

In 1910 W. F. Johnson, an African American from Greensboro, designed an electric-powered airplane that he felt was "absolutely safe from dangers of turning over in the air or falling." A model he built of his aircraft won first place at the Central Carolina Fair, but he could not afford to build a full-size plane. William D. Polite, headwaiter at a hotel in Wilmington in 1915, patented a powerful gun for shooting down airplanes. Several North Carolina African Americans flew in World War II with the all-black Tuskegee Airmen unit, the most highly decorated outfit in the war.

It's for all these reasons, and not just the Wrights' first flight, that "First in Flight" makes a good motto for North Carolina license plates. We've earned it!

The Wright Brothers in North Carolina

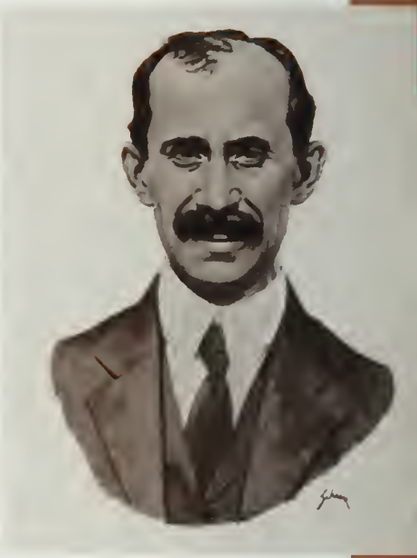
*by Stephen Kirk**

Do students in countries halfway around the world know about Charlotte, Raleigh, and other big cities in North Carolina? Probably not. But they've heard of Kitty Hawk, a village that was home to only a handful of people a century ago. We can thank the Wright brothers for that.

Wilbur Wright.

Wilbur Wright was born in Indiana in 1867. Orville Wright was born in Dayton, Ohio, four years later. During their boyhood in Dayton, they published and printed a small newspaper. As adults, they opened a shop where they designed, built, and repaired bicycles.

The Wright brothers enjoyed making kites and playing with a helicopter toy their father gave them when they were boys. Later, they followed the news of glider experiments in America and Europe. In 1899 Wilbur began to gather information about flight. He also wrote the United States Weather Bureau to learn about wind speeds in different places around the country. Flying a glider into a strong, steady breeze helps keep it in the air.



Orville Wright.

The Weather Bureau told Wilbur about Kitty Hawk on the Outer Banks. Wilbur then wrote the Kitty Hawk weather station to ask about the area. He received a warm reply from the local postmaster, Bill Tate. Kitty Hawk had more to offer than just strong winds, Tate told Wilbur. It also had soft sand for landing a glider and friendly people who would be willing to help. And it was an isolated place where Wilbur could get the privacy he wanted.

Wilbur arrived in Kitty Hawk to begin his glider experiments in September 1900. Orville joined him a couple of weeks later. They stayed briefly with Bill Tate's family and then lived in a tent set up on the sand. When they returned in the fall of 1901, they constructed a small wooden building to house their glider. They came for a third time in the fall of 1902. The Wright brothers stayed in North Carolina only a few months at a time. They returned to Dayton each year

Dan Tate and Wilbur Wright launch the 1901 glider. *Courtesy of Wright State University.*

Stephen Kirk works as an editor at John F. Blair Publisher in Winston-Salem. The company printed his book, First in Flight: The Wright Brothers in North Carolina, *in 1995.*

While they were assembling the 1903 flyer, the Wright brothers flew the 1902 glider over the sand dunes of Kill Devil Hills. *Courtesy of Wright State University.*

to run their bicycle shop and to design a new glider for the next season. They built the glider parts in Dayton, shipped them to Kitty Hawk, and assembled the craft there.

Three things were necessary for powered flight. The Wright brothers had to design wings that could keep an airplane in flight. They also needed a control system to steer left and right, move up and down, and bank one wing higher than the other. Finally, they needed a light but powerful engine and propellers to push the craft.

By the end of the 1902 season, the Wrights were making glides over six hundred feet long. Their wings kept them in the air, and their control system allowed them to steer and land safely. Back in Dayton that winter, they built an engine and two propellers, the final elements they needed.

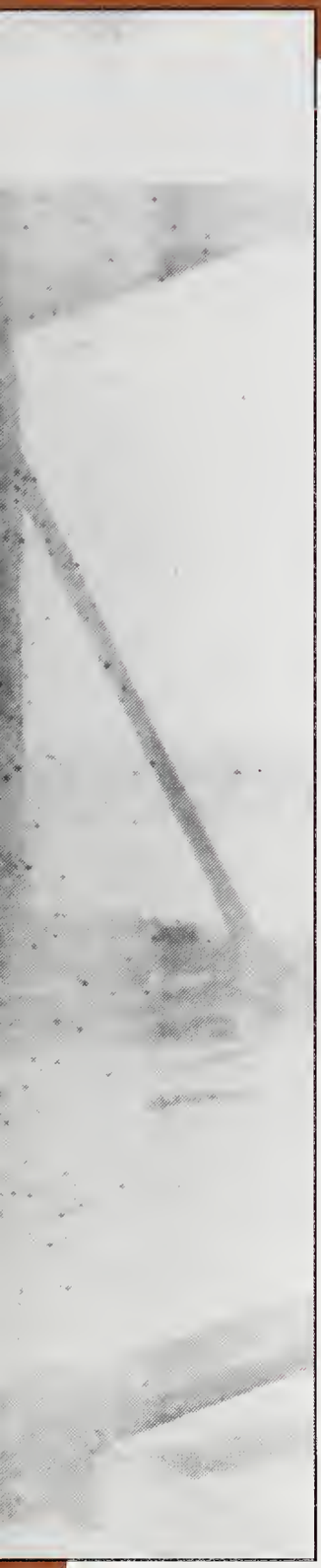
The Wright brothers had a good deal of trouble during the 1903 season in Kitty Hawk. They arrived in early September but weren't ready to try their powered craft for more than three months. That was mainly because they kept breaking engine parts. They had to ship the parts to their bicycle shop in Dayton for repairs and wait until they were returned.

On December 14, they were finally ready to try their powered airplane. Several of their friends from the local lifesaving station came to witness the event. So did two boys and a dog. The Wright brothers flipped a coin to decide who would

The world's first airplane hangar, Kill Devil Hills, November 1903. The origin of this photograph from the museum's collection is unknown. It does not appear in other collections of Wright brothers photographs.

make the first flight. Wilbur won. But when he tried to take off, he steered the craft upward too quickly, and it crashed.

The Wright brothers were tempted to head back to Dayton for Christmas, but they decided to make one more try. On December 17, some of their lifesaver friends came again to help move the heavy craft and to serve as witnesses. It was now Orville's turn. Just after 10:30 that cold morning, he made the first powered airplane



flight in history. It lasted twelve seconds and covered 120 feet. An hour after that, Wilbur made a short flight. Then Orville flew 200 feet. Finally, at noon, Wilbur made a flight that covered 852 feet and lasted nearly a minute. After that, the craft was flipped over by the wind and was damaged beyond repair. But the Wright brothers had achieved their goal.

Over the next several years, the Wright brothers improved their designs and made longer flights in Dayton, in Europe, and in other places. They returned to Kitty Hawk in 1908, when they made the first two-person flights in history.

The Wright brothers became the first international celebrities of the twentieth century. Kings and millionaires wanted to meet them. Songs, poems, and plays were written about them. Some people even began to dress like them. But they always remained humble, private men who cared little about money.

Wilbur died in 1912, at age forty-five. Orville remained a spokesman for flight until his death in 1948. He returned to Kitty Hawk several times in his later years and kept up his friendship with Bill Tate.

The airplane would have been invented without the Wright brothers, but it might have taken ten or twenty more years. This would have had important effects on World Wars I and II, when airplanes were used in combat.

The years since 1903 have seen great advances in flight. Airplanes crossed the oceans and flew faster than the speed of sound during Orville Wright's lifetime. And it was only twenty-one years after his death when Neil Armstrong walked on the moon. To honor the Wright brothers, he carried a piece of their 1903 plane with him.

Many people have contributed to the story of successful flight, but the Wright brothers wrote the first chapter.

A small crowd assembled by the flyer before an unsuccessful trial on December 14, 1903.

Flying the Unfriendly Skies: North Carolinians in the Two World Wars

by Tom Belton*

When North Carolinians first heard the news of the Wright brothers' successful flights at Kitty Hawk in December 1903, probably few envisioned the military potential of aircraft. However, only a few years later, scores of North Carolinians found themselves flying primitive aircraft across the unfriendly skies of France, and in less than four decades after the Wrights' first flight, thousands of Tar Heels would fly missions in a global war that reached the corners of the earth. Today North Carolina is a major center for aviation-related military bases. These include the Coast Guard station at Elizabeth City; the Marine Corps Air Station at Cherry Point, which provides support for marines at nearby Camp Lejeune; Seymour Johnson Air Force Base in Goldsboro; and Pope Air Force Base and Simmons Army Airfield at Fort Bragg, which support elements of the army's Eighteenth Airborne Corps. Many of these bases experienced troop deployment recently in Operation Iraqi Freedom, and those stories will be told in coming years. Here you can read brief narratives of a few Tar Heels who took to the skies in World Wars I and II.

James McConnell *(fourth from left)* and Kiffin Rockwell *(seventh from left)*, along with other members of the Lafayette Escadrille.

WORLD WAR I

Kiffin Yates Rockwell

Tennessee native Kiffin Yates Rockwell (1892–1916) moved to Asheville when he was fourteen years old. Like a number of Americans, Rockwell fought for France before the United States entered World War I. In 1914 he joined the French Foreign Legion and was wounded in ground combat. In 1916 he became one of the seven original members of the Lafayette Escadrille, a group of American flyers fighting for the French. On May 18 of that year, Rockwell became the first American to shoot down a German plane. He shot down three more enemy aircraft before being killed in combat on September 23, 1916.

James Rogers McConnell

Born in Chicago, James Rogers McConnell (1887–1917) was living in Carthage, Moore County, when World War I began. McConnell joined the volunteer American Ambulance Corps in France in 1915. He became a war correspondent and then joined the Lafayette Escadrille in 1916. He was killed in combat on March 19, 1917.

Lieutenant Arthur Bluethenthal.

Arthur Bluethenthal

Arthur Bluethenthal (1891–1918), a native of Wilmington, was a star football player at Princeton in 1912. In 1916 he joined the French army as an ambulance driver. He underwent flight

*Tom Belton works as the curator of military history at the North Carolina Museum of History. He is currently working on a book about Civil War flags.

training and was assigned to Escadrille 227 of the Lafayette Flying Corps as a bomber pilot in March 1918. Bluethenthal was killed in action on June 5, 1918. His body was brought from France in 1921 and reinterred in Oakdale Cemetery in Wilmington. Later, the Wilmington airport was named Bluethenthal Field in his honor.

George Preddy and his P-51D Mustang *Cripes A'Mighty 3rd. Courtesy of Greensboro Historical Museum.*

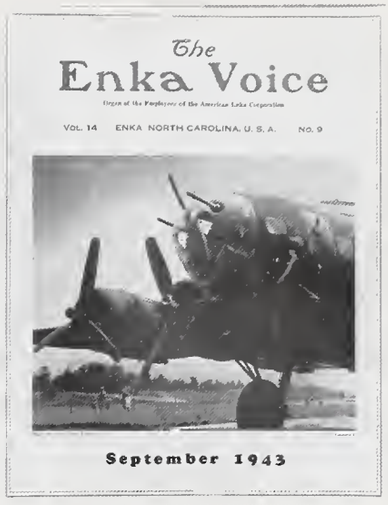
WORLD WAR II

George E. Preddy Jr.

George E. Preddy Jr. was born in Greensboro in 1919 and attended local schools. He enlisted in the National Guard in 1940 and later received a pilot's license and a commission as second lieutenant in the Army Air Corps. Preddy flew his first mission against the German Luftwaffe (air force) in September 1943. On August 5, 1944, Preddy shot down six enemy planes in one day, for which he received the Distinguished Service Cross. On Christmas Day 1944, Preddy's plane was shot down by friendly fire, and he sustained fatal wounds. He flew a total of 143 missions, logged more than 532 combat hours, and scored 5 ground victories and more than 26 aerial victories.

Robert Morgan

Born in 1918 and raised in Asheville, Robert Morgan joined the Army Air Corps in 1940. He flew the B-17 *Memphis Belle* to England in October 1942. Seven months later that plane became the first American heavy bomber to complete twenty-five missions over Europe. It accomplished this feat without losing a single crew member (and losses among bomber formations flying into Europe reached 80 percent). After returning to the United States, the crew of the *Memphis Belle* toured the country to promote war bonds. Morgan then served in the Pacific theater, flying a new B-29 he named *Dauntless Dotty*. After completing another twenty-five successful missions, he retired from active duty in April 1945. He served in the Air Force Reserve until retiring as a full colonel in 1965.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The *Memphis Belle* visited Enka, North Carolina, in 1943 during its "victory" tour of the United States.

Thomas Ferebee

Thomas Ferebee was born in 1918 and raised on a farm near Mocksville, Davie County. He joined the Army Air Forces and, after two years in flying school, was assigned as a bombardier in England. He flew in the first American bombing mission over Europe, successfully attacked German-held oil fields in Romania, and led the first bombing runs over North Africa. Because of Ferebee's skill and accuracy, pilot Colonel Paul Tibbetts chose him as bombardier on the *Enola Gay*, which released the world's first atomic bomb over Hiroshima, Japan, on August 6, 1945. After World War II, Ferebee was promoted to colonel. He served on B-52s during the Vietnam War and retired from the military in 1970. Ferebee died on March 16, 2000.

Major Thomas W. Ferebee *(standing, third from left)* and the crew of the *Enola Gay*, Mariana Islands, 1945. *Courtesy of National Archives and Records Administration.*

Thomas Oxendine, newly commissioned as a naval aviator, ca. 1942. *Courtesy of Commander Thomas Oxendine, USN (Ret.).*

Thomas Oxendine

Thomas Oxendine, a Lumbee from Pembroke, Robeson County, was born in 1922. In November 1942 he became the first American Indian commissioned as a naval aviator. After completing flight training at the Naval Air Station in Jacksonville, Florida, Oxendine was assigned as a scout observation pilot aboard the USS *Mobile*. On July 26, 1944, he landed his seaplane in the midst of Japanese gunfire, in adverse weather, to rescue a downed fellow airman. For this he received the Distinguished Flying Cross. He later served in Korea and Vietnam and was director of plans for the navy's Office of Information in the Pentagon. After retiring in 1970, he became chief of public information at the Department of the Interior's Bureau of Indian Affairs.

Katherine Lee Harris Adams

Durham native Katherine Lee Harris Adams (1919–2002) became a civilian aviator while a student at Duke University. She joined the Women Airforce Service Pilots (WASP) in 1943 and served at Napier Field in Dothan, Alabama, for much of 1944, flying and testing repaired AT-6s. Her unit disbanded in December 1944, but Adams stayed in Alabama and instructed flight cadets on Link trainers until the end of the war.

Vernon Haywood

Vernon Haywood was born in 1920 and reared in Raleigh. He attended Hampton College in Virginia, one of six African American institutions that offered civilian pilot training. After completing his instruction in 1941, Haywood studied at Tuskegee Institute in Alabama. In 1942 Haywood was called into the Army Air Corps. He became a member of the 332d Fighter Group and was sent to Italy. There he flew seventy combat missions in a number of different aircraft. In 1948 Haywood, then a colonel, was assigned to Williams Air Force Base in Chandler, Arizona, where he became one of the first African American jet pilots and also one of the first black jet instructors.

Raymond H. Wilkins

Raymond H. Wilkins (1917–1943), a major in the Army Air Corps and a resident of Columbia, Tyrrell County, received the Medal of Honor for heroic action on November 2, 1943. During a bombing raid on Japanese ships near Rabaul, New Britain, Wilkins died after attacking and sinking

two Japanese vessels and damaging others. On April 5, 1944, the War Department honored Wilkins posthumously by awarding him the Congressional Medal of Honor.

Edward F. Rector

Edward F. Rector was born in Marshall, Madison County, on September 28, 1916, and attended Catawba College. He joined the navy in 1939 and received training as an aircraft carrier pilot. Rector was an early recruit to the American Volunteer Group, nicknamed the Flying Tigers. That group was organized to protect Chinese cities and the valuable supply route known as the Burma Road from Japanese attack. On December 20, 1941, Rector downed a Japanese bomber near Kunming, China, during the group's first combat mission. When the Flying Tigers disbanded on July 4, 1942, Rector joined the Twenty-third Fighter Group. By the war's end, he had risen to colonel and had been credited with destroying more than ten Japanese planes. Rector remained in the military after the war, retiring from the air force in 1962. He died on April 26, 2001, and was buried in Arlington National Cemetery.

Lieutenant Vernon Haywood, Tuskegee Airman, ca. World War II. *Courtesy of Pima Air and Space Museum, Tucson, Arizona.*

Katherine Lee Harris Adams *(far right in photo)* and fellow WASP pilots in flight coveralls.

Tiny Broadwick: The First Lady of Parachuting

*by Elizabeth Whitley Roberson**

North Carolina was the site of the first powered airplane flight in 1903. In 1913, only ten years later, a native North Carolinian became the first woman to make a parachute jump from an airplane.

Her birth name was Georgia Ann Thompson. She was born in 1893 on a farm in Granville County, the youngest of the seven daughters of George and Emma Ross Thompson. Because she weighed only three pounds at birth, her family called her Tiny, a name she carried the rest of her life, because even when fully grown, she stood just a few inches over four feet tall and weighed a mere eighty pounds!

Tiny's family had a difficult time making a living on the farm, and when Tiny was about six years old, her father moved the family to Henderson, where he found work in a local cotton mill. In those days many girls married at a very early age. Tiny did just that in 1905, and the next year she gave birth to a daughter. Because of the added expense of caring for a baby, Tiny had to stop going to school and find a job to help support herself and her baby, since her husband had abandoned them.

The only job available for her at the time was in the mill where her father worked. Her job there involved working twelve- and fourteen-hour shifts, for which she received only forty cents a day! After working those long hours, she had to go home to care for her infant daughter. Gradually, the strain of work and worry about providing for her family took its toll on the frail girl, and she could only hope for some relief and dream of a better life. Unknown to her, that relief would soon come, the day the Jones Carnival arrived in nearby Raleigh.

Tiny had heard her coworkers talking about the State Fair coming to Raleigh and about all the exciting things to see there. She found someone to take her to Raleigh when the fair arrived in 1907, and there she saw the act "The Broadwicks and Their Famous French Aeronauts," which was part of the Jones Carnival.

The act was used to draw crowds into the midway and involved the ascent of a hot-air balloon. The performers went up in the balloon's basket, then climbed over the side and floated back down to earth. Tiny said about her first reaction to seeing this act, "When I saw that balloon go up, I knew that's all I ever wanted to do!" After the show was over, she talked to Charles Broadwick, the owner, and asked if she could travel with the group and become a part of the act. Broadwick could see that Tiny, with her beauty and her diminutive size, would be a great drawing card for his show, and he agreed to hire her.

Tiny then had to persuade her mother to let her join the carnival. Her mother agreed, but only if Tiny would leave the baby with her. Tiny felt that would be best, particularly since Broadwick agreed to send part of her salary back home for the baby's support.

Tiny then packed her few belongings and set out for a new life that would take her far from the tobacco fields and cotton mills of North Carolina. Under the tutelage of Charles Broadwick, she began a career that led her all over the United States, making her the sweetheart of carnival crowds.

Tiny Broadwick. *Courtesy of Elizabeth Whitley Roberson.*

**Elizabeth Whitley Roberson teaches at Williamston Middle School in Williamston. She is a former THJHA adviser and has written the books* Weep Not for Me, Dear Mother; In Care of Yellow River, *a companion book to* Weep Not; *and* Tiny Broadwick: The First Lady of Parachuting

Tiny first jumped in 1908 at the North Carolina State Fair. When asked what her feelings were when she parachuted off the balloon, she said, "I tell you, honey, it was the most wonderful sensation in the world!" She said that from up in the air she could appreciate the beauty of the earth from a new perspective and felt that she was in the presence of God.

Broadwick capitalized on Tiny's diminutive size, her long brown curls, and her youth by dressing her like a doll and billing her as the Doll Girl. She was outfitted in ruffled bloomers, with pink bows on her arms, ribbons in her long curls, and a little bonnet on her head, all of which made her look like a small child. In later years, Tiny confessed that she was really a tomboy and hated having to dress up like that.

After Tiny joined the group, Broadwick got permission from her father to adopt her legally as his daughter, giving her the name Tiny Broadwick. According to family members, Tiny's father did not object to the adoption, since the social practices of the time dictated that it was improper for a young girl to travel around the country alone with an older man.

Tiny Broadwick and pilot Glenn Martin in San Diego, California, 1914, during a demonstration to the United States Army. As a result, the parachute pack was adopted by the military, which still used it in 1998. *Courtesy of Elizabeth Whitley Roberson.*

Broadwick began teaching Tiny the craft of parachuting. Her performances drew large crowds, and she became the star attraction of the show. Newspaper accounts described her as the most daring female aeronaut (balloonist) ever seen and marveled at the dangerous maneuvers she performed with apparently little or no fear.

The Broadwicks traveled all over the country with their balloon act, but by 1912 that type of performance had become outdated, and by chance a new challenge confronted them. They went to Los Angeles, California, to participate in an air meet, and there Tiny met a famous pilot named Glenn L. Martin. He had seen her jump from a balloon but wanted her to parachute from his airplane instead. He could see her potential for attracting crowds to watch his airplane act. When he asked Tiny if she would parachute from his plane, without hesitation she said yes. This event marked a whole new chapter in Tiny's career and ultimately gave her a place in history.

She used a parachute developed by Charles Broadwick. It was made of silk and, when packed, looked like a knapsack attached to a snug-fitting canvas jacket with harness straps. A string was fastened to the fuselage (body) of the plane and woven through the parachute's canvas covering, so that when the wearer jumped from the plane, the cover would be ripped off, leaving the parachute free to fill with air. Tiny was suspended from a trap seat just behind the wing and outside the cockpit, with the parachute on a shelf above her. Martin took the plane up to two thousand feet, and then Tiny released a lever alongside the seat, allowing it to drop out from under her.

After her first jump from Martin's plane, Tiny was in great demand all over the country. In 1914 she was called upon to demonstrate to government officials the effectiveness of parachutes as an avenue of escape for pilots. Many pilots had perished because they had no way to get out of a falling plane. Tiny made four jumps that day, three of which were successful.

On the fourth jump her parachute's line became entangled in the tail assembly of the plane. The force of the wind flipped her small body back and forth, and she could not get back into the plane. She didn't panic, however. Instead, she cut off all but a short length of the line and then pulled it by hand, freeing the lines that opened the parachute. This development was later called a rip cord. By her quick thinking, Tiny became the first person ever to make a planned free-fall descent. Her accident meant that a person leaving a plane would no longer need a line attached to the aircraft to open his or her chute. Tiny demonstrated that day that a pilot could safely bail out of an airplane. The parachute became known as the life preserver of the air.

After more than one thousand jumps, Tiny made her last one in 1922. Her ankles had begun to bother her when she landed. She was very reluctant to give up parachuting because, she said, "I breathe so much better up there, and it's so peaceful being that near to God." She spent her last years in California but was buried in Henderson, North Carolina, after she died in 1978 at the age of eighty-five.

In her way, Tiny Broadwick helped give confidence to the thousands of flyers who came after her; they knew that there was a way to escape a failing aircraft. She contributed to the flight history that helped make America the nation that gave wings to the world. Tiny was truly a pioneer and will always be remembered as the First Lady of Parachuting.

Touching Base with a Tuskegee Airman

*by Doris McLean Bates**

Have you heard about a group called the Tuskegee Airmen? Officially known as the Ninety-ninth Pursuit Squadron of the United States Army Air Corps, the Tuskegee Airmen was the first African American air force unit in the nation. The Airmen served during World War II. According to group records, 992 men completed flight training at the segregated Tuskegee Army Air Field at Tuskegee Institute in Alabama, where the squadron was based. Of that number, 445 served as combat pilots. In 1944 the Tuskegee Airmen joined three other all-black fighter squadrons to form the 332d Fighter Group. Sixty-six aviators were killed in combat and training, and thirty-nine men were shot down and became prisoners of war. During the war, the group completed more than fifteen thousand sorties (missions), destroyed more than 250 enemy aircraft, sank one enemy destroyer, and demolished numerous enemy installations in Europe. Notably, none of the bomber aircraft escorted by the Airmen was lost to enemy planes. The Tuskegee program expanded to train pilots and crew to fly bombers toward the end of World War II, but the conflict ended before they could be deployed. Ultimately, the achievements of the Tuskegee Airmen helped to lead to the integration of the military in 1948.

First Lieutenant Wilson Vash Eagleson served as a Tuskegee Airman. He is one of twenty original Airmen who call North Carolina home. There are approximately forty-five Tuskegee Airmen chapters across the United States, and the one based at Seymour Johnson Air Force Base in Goldsboro is named after Mr. Eagleson. THJHA thanks him for consenting to a September 12, 2003, interview, upon which this article is based. Read below to gain insight into his experiences as a Tuskegee Airman.

Born on February 1, 1920, Wilson Vash Eagleson grew up in Bloomington, Indiana. As a child, he suffered with rheumatic fever and needed a moderate climate, so he and his sister had to live with his grandmother in Bloomington after his parents were offered jobs at North Carolina Central College (now University). His father was the first football, basketball, and baseball coach at the Durham college. His mother was a registrar at the same institution for about forty-eight years. "I grew up in Bloomington, Indiana, and I lived there until my father was killed in a car wreck when I was thirteen years old. But the year before that, he took me to the fair, and I got to ride in an aircraft—one of the old two-seater barnstormers. And from then on, the only thing that I really wanted to do was fly." Eagleson moved to Durham in 1934, after his father's death. He said that the mascot for the college was named after his father. Eagleson notes, "They're called the Eagles. And there's a dormitory on the campus that's been named for my mother. So I grew up basically in a college atmosphere as a youngster. And we were on one side of town, and we basically stayed there."

After he graduated from high school in Henderson, he went to West Virginia State College, where he became a member of the Civilian Pilot Training program in 1938. "Of course, the first thing that I did was volunteer for the air force. And we were of course told then that [they're] not taking colored, as we were called then, into the air force. So I continued in school, coming back to Indiana University and spending a year there. And I went into service on January 19, 1942. But I went into the infantry. And I spent two tours at a little base called Fort Walters, Texas: one as a trainee, and one as a cadre, training the new bunch of men behind me. From there I went to Fort Benning, Georgia, to Officer Training School." One day the commander there told Eagleson to pack his bags, as he was going to Tuskegee to learn to fly. He had applied for the flight program at Tuskegee Army Air Field, and he had been accepted in September 1942. Eagleson graduated from the training at Tuskegee and was commissioned on April 29, 1943. He got married on May 1, 1943, and left for war in September 1943. He was overseas for eighteen months, returning home in March 1945.

Wilson Eagleson as a young aviator in 1943. *Courtesy of Cleopas Mason.*

He commented on his wartime service. "Someone asked me once what it was like to fly in combat. I said, 'Well, it could be seven or eight hours of complete boredom and thirty to forty seconds of sheer bedlam.'" Eagleson went overseas with the Ninety-ninth Pursuit Squadron. "We were a single outfit attached to some of the other groups, and most of our work then was dive

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bombing and strafing missions. We were flying out of Naples, Italy; we covered the Battle of Anzio, and that's when we began . . . to show what we could do." He shot down two enemy aircraft and got two probables over Anzio.

In 1943 the Airmen were flying old P-40s, and on July 4, 1944, they got their first P-51 and "that was the start of the Red-Tail Angels." The group was supposed to have a red stripe across the tails of their aircraft. "And of course if you look at aircraft today in the military, they all have something to identify them with." A member of the group did not think that the red stripe was big enough, so the entire tail was painted red. "And believe it or not, the other three groups in the wing that we were in copied us. We had one group called the Checkerboards; they painted their whole tail checkerboard. Another was the Candy Stripes, and they painted their whole tail with candy stripes. And I believe that the fourth one was a solid yellow. But we all . . . had tails that you could see from any distance. So in July of 1944, we got our first P-51. And you know, that was a gorgeous thing. That was the first plane that we'd ever had in the outfit that wasn't painted with the camouflage colors. This was solid silver."

Wilson Eagleson as he appears today. *Courtesy of Cleopas Mason.*

Returning to a previous thought, Eagleson said, "Basically this was . . . where that seven or eight hours of boredom came from. Anywhere up to the minute of bedlam. Because the dog fights [that] you see on TV don't last long like that. It's a quick thing. You either miss them or they get you, or you get them or they miss you. But at 4 or 500 miles an hour, you don't have time to turn around [to] look and go back and shoot at someone again because you're too far apart. So basically [there's] one pass at the most."

Eagleson's group served in Africa, Sicily, and Italy. "I joined when we were still stationed in Sicily, but most of our flying was done out of Italy, because we flew the southern portion of Italy. We did have one long-range mission to Berlin one day, but basically it was escorting the B-17s and B-24s out of Italy, and there were still some in Sicily. We were escorting them . . . all the way across . . . Romania."

Eagleson received numerous awards and honors for his service. He has a Distinguished Flying Cross, an air medal, a Korean campaign medal, and a Vietnam campaign medal, among others. He believes that he has eighteen medals and ribbons altogether, and they make a "nice fruit salad badge on your uniform."

After returning home in March 1945, he helped to close down the Tuskegee Army Air Field and went to inactive duty after being RIFed (reduction in force) following the war. "But I spent so much time in and around the airport and aircraft, my wife said one day, 'Why don't you go back and serve, since you love the air place that much?' So I went down one day and enlisted in the Army Air Force then. So I spent a total of thirty years in service."

When asked how he was treated by service people outside of his race during his military career, Eagleson replied, "Not any different from before the war. When we came back from overseas, for instance, there were German prisoners of war [who] had complete run of the base. They could go to the movies and anyplace that they wanted to, but we were still segregated. We came back from overseas, and we went through the Colored entrance and got on buses and trains and went home. The others went down Broadway and had a ticker-tape parade. We were never actually welcomed home. In fact, it wasn't until 1948 that they desegregated the military forces. There was not much recognition for what we had done. In fact, I guess in the last five to six years [has it been] recognized that we were a part of the winning team in World War II."

Eagleson comments on the state of race relations today. "It's been a great change, especially around air bases. I think that the people close to the air bases recognize the contributions that the armed forces have provided, and they are much, much more tolerant than they used to be. You still have some areas of prejudice, some areas of segregation. . . . But basically, it's a great, great improvement."

Today he is a member of the Wilson Eagleson Chapter of the Tuskegee Airmen at Seymour Johnson Air Force Base. He does lectures at schools, churches, civic organizations, air shows, and other places. Eagleson tells the story of what the Airmen did, "what happened to us, basically [to] keep the history alive."

North Carolina's

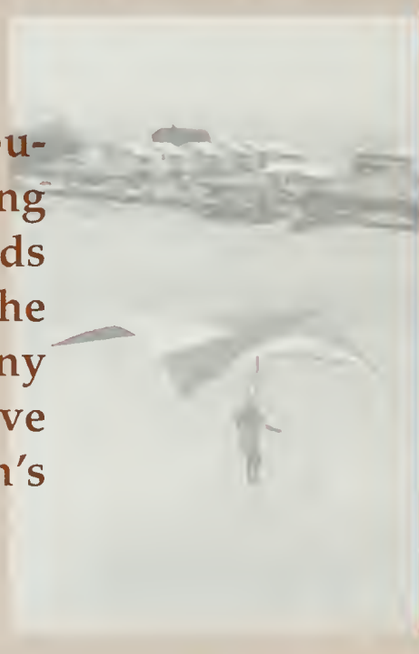
A Photographic Essay

Contributions to Aviation

by Rebecca Lewis*

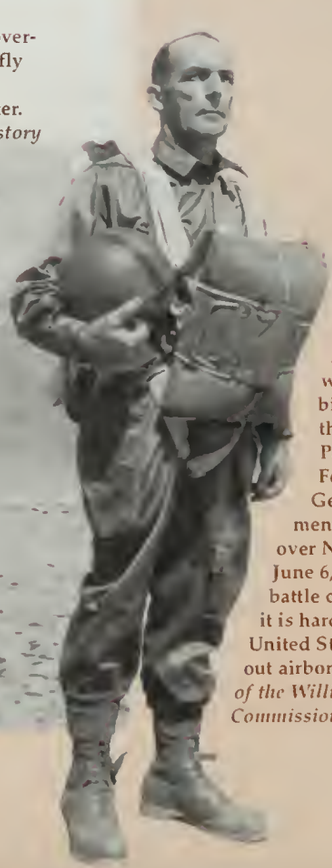
During World War II, the German navy tried to establish a blockade off America's East Coast with its U-boat (submarine) fleet. In Pasquotank County, the United States navy constructed a lighter-than-air aircraft base from which blimps conducted aerial surveillance and protected convoys of ships bound for Allied Europe. The number of ships lost off North Carolina's coast dropped from one per week to one every two and a half months after the Weeksville base became operational. Today the remaining hangar is home to most of the blimps flying in the United States. *Courtesy Museum of the Albemarle.*

North Carolina has made many contributions to flight. In addition to providing wide, sandy beaches and steady winds perfect for conducting the first flight, the Tar Heel State has been home to many institutions and individuals that have had a profound influence on man's progress "in the air."



After the Wright brothers flew in 1903, most of the interest in aviation turned from gliding, or free flight, to powered aircraft. Not until the 1960s did hang gliding as we know it today emerge, as the direct result of Francis Rogallo's flexible-wing design. This simple wing concept has spawned a multimillion-dollar industry. Today more than 10,000 members in the United States Hang Gliding Association and thousands more novices learn to hang glide or paraglide every year at places such as Jockey's Ridge. *Courtesy of North Carolina Division of Tourism, Film, and Sports Development.*

Some historians believe that Wilbur and Orville Wright's glider experiments would have taken longer without the assistance of the able-bodied lifesavers of the Outer Banks. By carrying the over-200-pound glider back up Kill Devil Hill after each glide, the lifesavers allowed the brothers to fly more often, gaining more experience in the air and more information on the principles of flight. Without this help, the Wright brothers' powered flight might have happened in 1904, 1905, or later. And it might not have been the first! *Photograph of lifesavers* (inset) *courtesy of Outer Banks History Center, Manteo; photograph of 1902 Wright glider courtesy of Wright State University.*



Dunn native William C. Lee is known as the father of the United States Airborne. In 1941 he was given responsibility for setting up the Provisional Parachute Group at Fort Benning, Georgia. When the men of the 101st jumped over Normandy on D day, June 6, 1944, they gave the battle cry "Bill Lee!" Today it is hard to imagine the United States military without airborne troops. *Courtesy of the William C. Lee Memorial Commission, Inc.*

The residents of Kitty Hawk provided transportation, room and board, assistance in the camp, and support in other areas of the Wright brothers' daily lives while they were in North Carolina. After the successful flight on December 17, 1903, some Kitty Hawkers became the Wright brothers' biggest promoters. People such as Captain Bill Tate, the brothers' first host, made sure the Wrights got the recognition they deserved as the first to fly. *Bill Tate's business card courtesy of National Air and Space Museum, Smithsonian Institution.*

ORIGINAL HOST TO WILBUR AND ORVILLE WRIGHT
AT KITTY HAWK 1900-1903

ORIGINAL N. C. AVIATION BOOSTER

CAPT. W. J. TATE

LIGHTHOUSE SERVICE

COINJOCK, N. C.

FIRST LIGHTHOUSE EMPLOYEE TO INSPECT NAVIGATIONAL
AIDS BY AIR

In 1913 secretary of the navy Josephus Daniels became the first member of a president's cabinet to fly in an airplane. Daniels, who also owned and edited the Raleigh *News and Observer,* began to champion the use of aviation in the military and secured $3.5 million from Congress—the first separate appropriation made for naval aviation. *From* First to Fly: North Carolina and the Beginnings of Aviation, *by Thomas C. Parramore. Copyright 2002 by the University of North Carolina Press. Used by permission of the publisher. www.uncpress.unc.edu*

In 1914 Tiny Broadwick demonstrated her stepfather's safety parachute for officials in the United States Army's Aviation Bureau. Use of Charles Broadwick's parachute gave military aviators the ability to jump to safety from distressed planes. Adoption of this safety device saved countless lives in World War I and beyond. *Courtesy of North Carolina State Archives.*

**Rebecca Lewis is the program coordinator of the Tar Heel Junior Historian Association. She served on the* Pioneers of Aviation *Exhibit Team, in addition to being the conceptual editor for this issue of* THJH.

Tar Heel Junior Historian Essay Contest

Elementary Division, First Place

*by Alexandra J. Cornejo**

December 20th, 1903

Dear Katharine Wright,

You must have heard of the success of the first flight of your brothers' flying machine three days ago. It was an exciting and glorious moment when the plane rose into the air for the first time. Unlike many, Katharine, I was confident that at some time, Orville and Wilbur's attempts at producing a real flying machine would be realized. I know that ever since they got that model helicopter from your father when they were boys, they have been dreaming of flight, and, as Wilbur said, "afflicted with the belief that flight was possible."

December 17th was a cold morning with an extremely blustery wind approaching gale force. Your brothers were contemplating staying the project till a day with less tempestuous winds, but I overhead them saying that they were eager to be able to celebrate Christmas with you and the family, and they were afraid if they did not try the Flier that day, they would not be able to reach home in time. So they decided to fly.

A flag was raised to call the lifeguards from Kill Devil Hills. Three responded.

At 10:35 a.m., puddles of frozen water sparkled in the sand as the first attempt began. The plane began on level ground, not sliding down a dune as before, so that it could qualify as a controlled, heavier-than-air, manned flight. Orville anxiously tried all the devices as he sat down on the Flier. I saw Wilbur biting his lip, standing at the foot of the rail. He steadied the Flier as it passed. The plane moved jerkily, dipped up and down, and jerked to a stop when a skid got caught in the sand. But it flew. It really flew! Despite the rather awkward and unceremonious descent, everyone was animated at this successful first endeavor of the day. Orville obtained a few scratches and bruises, but he bore these readily with a joyful spirit. This flight was only 120 feet, but what a magnificent achievement! Your brothers have conquered the air!

Two other flights followed on this day; the fourth was most successful. By noon, the wind had abated some, although it was still strong enough to carry my new ostrich-plume hat right off my head.

As I awaited the fourth flight, I took more careful notice of the camp and realized how many comforts your brothers had sacrificed for this goal; the camp was not much more than two canvas tents and a large, hollow willow tree, which looked forlorn on the barren sand. Blackflies, too, buzzed around and annoyed us terribly, yet not as much as in the summer.

As the Flier slid off the guide rail and into the air for the fourth time, all that could be heard was the clinking of the parts, flapping of the sheets, and the steady wind rustling the dune grass. At first, the Flier moved awkwardly, but gradually its flight became more smooth and flew evenly for almost 800 feet until, suddenly, it began to be unsteady again, and with a final swoop, landed. Wilbur stepped out of the Flier and threw his cap into the air. At this, everyone began to cheer. This had been the most successful flight of the day: Wilbur had flown for 59 seconds and covered 852 feet!

I do hope that you have enjoyed reading my narrative of the recorded events, though I am not much of a journalist. I trust that you and your family are in good health. Have a blessed Christmas.

I am ever yours truly,

Helen Kingston

**Alexandra J. Cornejo placed first in the elementary division of the 2003* Tar Heel Junior Historian *Essay Contest with her entry above. Alexandra was a sixth-grade member of the Head over Tar Heels History Club at Cornus Carolina Christian Academy in Reidsville, Jeanne Cornejo, adviser.*

Tar Heel Junior Historian Essay Contest

Secondary Division, First Place

by Carla Purvis*

The Impact of Aviation on Humankind

December 17, 1903, is a day in history that has forever changed humankind. Wilbur and Orville Wright's short flight, which lasted only about twelve seconds, opened the door to a means of travel that has made almost every place on earth accessible, and even opened the door to space travel and man walking on the moon. Humans had long dreamed of escaping the laws of gravity and flying through the air; the Wright brothers made this dream a reality that day on Kill Devil Hill at Kitty Hawk, North Carolina. One has to wonder if Wilbur and Orville dreamed how important their invention would be, or that within a few short years, airplanes would be used for so many practical uses.

I believe that the most significant impact that aviation has had on humankind has been to make the world a much smaller place. While the world has not shrunk, the time it takes to reach one place from another has. Not so many years ago, travel across oceans took days aboard a ship. Even travel across the United States took several days aboard a slow, noisy train. Today's traveler can go to an airport, board a jet, and depending on the number of times they change planes, can probably be in any major city of the world within a twenty-four-hour time period. This has changed the way the world does business. For example, today businesses can send overnight deliveries to fix a broken machine that once would have had to sit idle for days or even weeks waiting for a delivery by means of ship or rail. Every day, airports are full of business travelers moving about the United States and the entire world, making the term *global economy* a reality.

During the Gulf War and our fight with terrorists in Afghanistan, the United States was able to secure victory almost entirely through air supremacy. The jets could deliver safely to their targets bombs [to achieve what] would have required much more time and many more American lives if it had been done on the ground. While war is not a pleasant subject, or the best use of airplanes, saving lives and protecting our country [are] important. Today when a country or group of people consider doing something against another country, they have to know that within a short time, they will be paid a visit by the air force of this country. The most significant uses of Wilbur and Orville Wright's invention [are] not military, however, but the ever present commercial uses of the airplane.

Every day, people fly to distant cities for medical purposes, to deliver much-needed drugs and treatments or to be treated themselves in a medical facility that is not available in their hometown. Every day, business travelers fly all over the world buying and selling goods to a worldwide market. New products and ideas can be shared with everyone. Every day, thousands of people travel by air to visit friends and family or to vacation somewhere they would never be able to drive to. The econom[ies] of cities such as Orlando, Florida, and Las Vegas, Nevada, depend upon air travelers. It is possible for someone to fly to Europe for a short vacation and be back home before they would have reached Europe by ship.

Making the earth smaller by air travel does have some drawbacks. There are cases where people with communicable diseases have spread them from one country to another by getting on a jet and flying. We also saw on September 11, 2001, that if someone wants to do evil with an airplane, the results can be terrible. However, the good far outweighs the bad when one stops and thinks about all of the positive impacts that air travel has had on modern society.

I think Wilbur and Orville would have been proud of the accomplishments that have been achieved through their life-altering invention. The future of air travel is both exciting and awesome. I believe that someday soon it will be possible to get on a space shuttle and travel to outer space commercially. Someday in the not-too-distant future, there will be colonies on other planets, and space travel to connect them to our world. Back here on earth, more cities will be connected by flights, and maybe someday, everyone will have their own personal flying machine, and driving down the road will seem as old-fashioned as driving a horse and buggy do[es] today.

**Carla Purvis placed first in the secondary division of the 2003* Tar Heel Junior Historian *Essay Contest with her entry. Carla was an eleventh-grade member of the North Moore Historians at North Moore High School in Robbins, Vincent Greene, adviser.*

Piedmont Airlines Flies the Blue Skies

*by Walter R. Turner**

Tom Davis was excited. Wearing a gray suit but no overcoat for the chilly morning, he greeted everyone in the crowd by name. He had worked years for this moment.

The final call came over the loudspeaker: "Ladies and gentlemen, Piedmont Airlines Flight No. 41 is now boarding at Gate 1 for Pinehurst, Charlotte, Asheville, Tri-Cities, Lexington, and Cincinnati."

Tom Davis, founder and president of Piedmont Airlines, leans out the doorway of Piedmont's inaugural flight from Wilmington to Cincinnati, Ohio, on February 20, 1948. *Courtesy of Piedmont Aviation Historical Society and North Carolina Transportation Museum.*

It was 7:00 A.M. on February 20, 1948, at the Wilmington, North Carolina, airport, and Davis, not yet thirty years old, was starting Piedmont Airlines with 250 employees and three used DC-3 airplanes. Another route connected Morehead City (during the summers), New Bern, Goldsboro, Raleigh-Durham, Greensboro–High Point, and Winston-Salem and extended to Louisville. The third route started that year was Norfolk to Cincinnati. Crew bases—which included pilots, pursers (male flight attendants), and maintenance workers—were established in Winston-Salem, Wilmington, and Norfolk. Within ten years, Piedmont had expanded to Hickory, Kinston, Jacksonville, Rocky Mount, and Elizabeth City.

Tom Davis earned loyalty from his workers. With his wonderful memory for names, Davis organized social gatherings for the employees and their families and listened to their concerns and suggestions. "He loved his people, and they loved him," recalled Bill Barber, a retired vice president with Piedmont.

In time, Piedmont expanded to new cities, including Washington, D.C. The airline made a profit each year; nevertheless, it was struggling financially.

In 1962 Piedmont was granted route extensions to Atlanta and other points that increased the company's flight mileage by 50 percent. The key advantage of the expansion was having connecting flights to "hubs" of the larger airlines Delta and Eastern in Atlanta. (An airline establishes a hub by creating flights to several cities from the same airport and offering convenient connecting flights to passengers.) Piedmont could also offer more flights to North Carolina's growing military bases, including Fort Bragg at Fayetteville, Camp Lejeune at Jacksonville, and Seymour Johnson Air Force Base in Goldsboro.

At first, Piedmont hired males as flight attendants because, in addition to serving passengers in flight, they were required to load and unload baggage and handle the hundred-pound entrance door on the old DC-3 airplanes. When the airline switched to newer airplanes in the early 1960s, Piedmont, like many regional airlines, began hiring female flight attendants, called stewardesses. Requirements for stewardesses were that they be in the 20-to-27-year age range, stand between 5 feet 2 inches and 5 feet 8 inches tall with proportional weight, and have 20/20 vision, short hair, and good personalities and character. The nation's largest airlines had hired female flight attendants since their beginnings in the 1930s.

In 1966 Piedmont Airlines began flying to New York City. Television advertising was too expensive, so Piedmont used radio and the sides of buses and taxicabs to promote this new service. Piedmont's eye-catching advertising slogan "Piedmont Airlines Puts New York City on the Map" appeared in area newspapers and magazines.

Passengers and profits increased during the decade. Net profits grew to more than $1 million in 1965 and nearly $2 million by 1967. Piedmont's

**Walter R. Turner is historian at the North Carolina Transportation Museum at Spencer. His book* Paving Tobacco Road: A Century of Progress *by the North Carolina Department of Transportation is scheduled for publication in November 2003.*

Piedmont Airlines began flying to Atlanta in 1962, giving the airline new opportunities for growth. *Courtesy of Piedmont Aviation Historical Society and North Carolina Transportation Museum.*

growth affected its headquarters in Winston-Salem, where office and hangar space were limited. A new office-hangar complex opened in 1968 and was more than three times the size of the facility it replaced. It could hold six jets for maintenance and repairs. Piedmont also expanded its jet fleet, relying on the Boeing 737, which at first seated ninety-four passengers. It was an easy plane to fly and could use small airports and fly long-range distances.

Piedmont hired Warren Wheeler as its first African American pilot in 1966, and Cheryl Ritchie as the company's first female pilot in 1974. The nation's other airlines took similar steps during this period. Hiring female pilots took longer because of concern about their handling the heavy controls. Ritchie had earned a pilot's license while working as a stewardess for Eastern Airlines.

After hiring a new public relations firm, Piedmont developed more advertisements, sponsored telecasts of Atlantic Coast Conference basketball games, and began sponsoring race car drivers. Bill Howard became the airline's president and CEO in 1983. Tom Davis, though officially retired, traveled widely to stay in touch with employees, and he chaired the board's executive committee.

Howard led the effort to establish Piedmont's first hub at Charlotte's Douglas Municipal Airport (the name soon changed to Charlotte/Douglas International Airport). The airline had started nonstop service to Miami, Pittsburgh, Boston, Denver, Tampa, and Dallas–Fort Worth from Charlotte by 1979. Charlotte's new terminal building and 10,000-foot parallel runways qualified the airport to serve as a hub. When the new terminal building opened in 1982, Piedmont surprised many people by having more business than arch-rival Eastern Airlines, which had long been Piedmont's biggest competitor at the state's largest airports.

In 1987 Piedmont began nonstop service between Charlotte and London, giving North Carolina a direct flight to Europe. At this time, Piedmont had a fleet of 177 aircraft carrying 23 million passengers per year to 235 locations. In the decade since 1977, the staff had grown from 3,711 to more than 21,000. As the airline got bigger, however, it cut service to cities that were not profitable, including Hickory, Rocky Mount, Elizabeth City, and even Winston-Salem.

(Left to right) Tony Rankin, engineer and second officer; Bill Wilkerson, captain; and Lori Griffin, co-captain, in the cockpit of a 727. *Courtesy of Captain Bill Wilkerson and North Carolina Transportation Museum.*

In the late 1980s, USAir (now US Airways), with headquarters in the Washington, D.C., area, purchased Piedmont Airlines for $1.6 billion.

Piedmont is remembered for its reputation for good customer service, for the family atmosphere among its employees, and for its safety. *Air Transport World* magazine chose Piedmont as the Airline of the Year for 1984. To North Carolinians, Piedmont Airlines was always number one!

Wheeler Airlines: An American First

*by Charles W. Wadelington**

In North Carolina, aviation experienced important developments in the late 1920s. In 1928 the state's first airmail flight landed at Lindley Field in Greensboro. By 1929 Raleigh introduced commercial air passenger service. Shortly thereafter, flights began to serve Greensboro and Charlotte. At the beginning of the 1930s, Charlotte, Greensboro, and Raleigh were served by the recently founded Eastern Airlines.

White Americans controlled all flying services. In fact, because of high fares, few African Americans took flights. However, by the end of the 1960s, more middle-class Americans could afford to fly. Because of this, all Americans began viewing airplanes as an economical way to travel. Yet not until 1969 did an African American own an airline. That person was Warren Hervey Wheeler.

Wheeler was born in 1943 in Durham. His father, John H. Wheeler, was a well-known businessman and civil rights leader. Wheeler's mother, Selena Warren Wheeler, was a well-respected businesswoman and librarian. Having a distinguished economic and social heritage, Warren Wheeler began his pursuit of a special dream.

Wheeler became interested in flying in the mid-1950s. According to his mother, "From the very beginning, I could see that flying was in Warren's blood." The year was 1957, and Wheeler was fourteen years old.

At the beginning of the 1960s, Wheeler received two very important items: a diploma from Durham's Hillside High School and a private pilot's license. After high school, Wheeler entered North Carolina A&T State College (now University) in Greensboro. There he studied electrical engineering; however, after his first year, he became bored and chose to continue his aviation training to receive a commercial pilot's license. Because of racial segregation, earning a pilot's license was not possible for Wheeler in North Carolina or in any of the other southern states. In order to realize his dream, he had to leave the South.

Warren H. Wheeler in his Piedmont Airlines uniform. *Courtesy of Selena Wheeler.*

The first commercial pilot training center to accept Wheeler was the American Flyers School in Ardmore, Oklahoma. According to Wheeler's mother, a school official stated: "We have never had [an African American], but if you send him, we will see what we can do." Wheeler's studies at school were successful, and in 1962 he achieved a major part of his dream: he was fully accredited and licensed to fly multiengine planes—at the age of nineteen! In fact, Wheeler obtained both his multiengine rating and his commercial license from the American Flyers School. He was the school's first African American graduate.

With credentials in hand, Wheeler returned to North Carolina in 1962, only to find that job opportunities for African American pilots were few and also that he lacked adequate hours of flying experience. He learned that certification by one of the top domestic flight training schools was not enough to obtain a position with a major airline. Realizing this, Wheeler, with financial backing from his family, opened his own flying school in 1962 at the Horace Williams Airport in Chapel Hill. His rationale behind starting the school was to obtain enough flight hours to meet the requirements for employment by the major commercial airlines. To do this, Wheeler purchased his first small aircraft and began instructing white students from the University of North Carolina at Chapel Hill. In addition to the school, Wheeler also began a charter service "to gain more flight experience."

After three years of operating a flying school and charter service successfully, Wheeler accumulated enough flight hours to qualify for employment by a major airline. His race continued to be a factor, however. None of the large airlines was willing to consider his application, until former governor Terry Sanford recommended him to Piedmont Airlines.

While governor (1961–1965), Sanford had flown on charter flights with Wheeler as pilot. Because of his confidence in Wheeler, Sanford recommended him to the president of Piedmont Airlines, Tom Davis. Out of respect for Sanford, Davis allowed Wheeler to take Piedmont's pilot examination. Wheeler met all of the qualifications, and in March 1966, at the age of twenty-two, became the first African American and one of the youngest pilots that Piedmont Airlines hired.

Although Wheeler was proud of integrating the pilot ranks at Piedmont, he was not through making history. He became the first African American to own a commercial air carrier when he founded Wheeler Flying Service in 1969.

Wheeler advertised his company as a charter, air cargo, and aircraft maintenance service. As president, he developed it to include eleven single- and twin-engine propeller aircraft. In its early years, the flying service averaged 8,000 passengers annually.

From 1973 to 1976, Wheeler Flying Service grew from a part-time charter air carrier into an important transportation link between several North Carolina

**Charles W. Wadelington, a retiree of state government, works as an independent researcher in Raleigh. He is the coauthor of the book* Charlotte Hawkins Brown and Palmer Memorial Institute: What One Young African American Woman Could Do.

towns. By 1973 the charter service was capable of going anywhere in the United States. From 208 passengers a month in that year, the company grew to carry more than 1,000 passengers each month by 1976. In response to a constantly increasing number of passengers, Wheeler changed the company's name to Wheeler Airlines. By 1976 the carrier had established regularly scheduled flights from Raleigh-Durham to Greenville, North Carolina; Charlotte; Newport News; Richmond; and New York's LaGuardia Airport. The

Warren Wheeler *(left)*, president of Wheeler Airlines, along with secretary Barbara Link and pilot McKinzey in 1969.

company also served smaller eastern North Carolina towns such as Kinston, New Bern, Nag's Head, and Wilson.

On some air routes, Wheeler's flights competed directly with Piedmont—and won. With the increased revenue, Wheeler was able to purchase a building, computerized facilities, and an aircraft maintenance hangar. His business grossed $380,000 in 1975. Wheeler had secured very profitable contracts from companies throughout the Raleigh-Durham and Research Triangle Park area. The Flying Service was the parent company of Wheeler Airlines, and by 1976 Wheeler's business was considered a reliable operation. The spring of 1976 saw another milestone in the history of the airline—air service to Asheville began. This made Wheeler a trans–North Carolina air carrier.

Such growth made it necessary for Wheeler to employ workers who were flexible and could quickly adapt to unexpected changes. On several occasions, the person who sold tickets would also be the pilot and the baggage handler. As economic conditions improved, so did the company's ability to hire additional employees. Wheeler had long felt that there were too few African Americans training for aviation careers. While interviewing prospective workers, he observed that African Americans were not accustomed to flying and had limited knowledge of careers in the flight industry. He also concluded that "flying any style [remained] a lofty phenomenon in black culture." Therefore, Wheeler had a difficult time finding African American pilots. The shortage was so great that in 1976 the Air Line Pilots Association reported that of an estimated 37,000 airline pilots, fewer than one hundred were black.

Throughout the mid-1970s and early 1980s, Wheeler Airlines enjoyed the distinction of being the only minority-owned airline in the nation. Warren Wheeler continued to work as a Piedmont Airlines pilot and also advanced in civic life. Between 1977 and 1980, he received appointments to North Carolina's Commission on Transportation and the Governor's Commission on Travel and Tourism, and the Organization of Black Airline Pilots presented him with a plaque for outstanding achievement.

In addition, Wheeler administered a minority pilot training program through the state Division of Community Employment as part of the federal Comprehensive Employment and Training Act (CETA) Title III. The first year, 1979, ten people participated in Wheeler's training. The CETA contract allowed him to train eight people as copilots and two as aircraft mechanics. Wheeler also negotiated with Eastern, United, and Piedmont Airlines to secure job placement for his students.

By the 1980s, Wheeler Airlines averaged more than 40,000 passengers a year and had expanded scheduled service to include additional cities in North Carolina, Virginia, Delaware, New Jersey, and New York. To provide that service, Wheeler increased his fleet to include several fifteen-passenger Beech 99 jet props and a larger, forty-passenger Fairchild F-27 turboprop. Warren Wheeler had achieved his goal of working for a major airline as well as his ambition of operating a successful commuter airline that offered career opportunities to African American and white men and women.

In response to the company's growth, Wheeler began another business—Wheeler Regional Airlines. It flew passengers from Richmond to Greensboro, chartered flights anywhere in America, and transported checks to Federal Reserve banks.

In 1989 Captain Wheeler became a pilot for Piedmont's successor, USAir. The same year he was appointed to Virginia's aviation board. Two years later, Wheeler became chair of the aviation board.

Because of an unstable economy during the 1980s, Wheeler Airlines had to close its doors. When Wheeler terminated the company in 1991, its fleet consisted of nine aircraft manned by seventeen pilots. In all, Wheeler's organization had employed approximately forty-five people. But from 1969 to 1991, Warren Wheeler had provided career training for more than one hundred men and women.

For twenty-two years, Wheeler lived his dream of owning the nation's first African American airline. Today he makes his home in the Virgin Islands and continues to fly.

A North Carolina WASP

*by Sandra O. Boyd**

Today women can pilot commercial airliners and military planes, but not too long ago, they could not get such jobs. After the Wright brothers flew the first airplane, both men and women learned to fly, but women did not get as many chances to become pilots as men did.

However, during World War II, one group of women did get to fly military planes. They were the Women Airforce Service Pilots (WASP). One of the WASP pilots, Katherine Lee Harris "Kate" Adams, was from Durham.

Katherine Lee Harris Adams.

As a child, Adams had loved learning about anything having to do with aviation. While studying at Duke University, she got the chance to take a Civilian Pilot Training (CPT) course. Colleges and universities around the country offered CPT programs, but they accepted only one woman for every ten men. Adams "jumped at the chance" to take the class and drove from Durham to an airfield east of Raleigh to take the flying lessons. When she graduated from Duke in 1941, she had a degree in fine arts and a private pilot's license.

That same year, Japan attacked the United States military base at Pearl Harbor in Hawaii, bringing the nation into World War II. Patriotic citizens wanted to know how they could aid our country. Women pilots wanted to use their flying experience to help the military, but at first the army rejected them. People criticized women for wanting to do a "man's job." However, the army needed pilots so desperately at the beginning of the war that it decided to allow women to fly military planes.

Kate Adams.

The WASP did many jobs for the military. They flew all types of planes, transporting them from United States factories to military bases around the country. Some WASP pilots towed targets behind planes so that soldiers could practice shooting at moving objects. They also risked their lives test-flying airplanes that had been damaged and repaired. Can you imagine how dangerous their work was?

Kate Adams did not have enough flying hours to qualify for the first class of women who joined WASP. But when the program reduced the number of flying hours required, she was accepted. After

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training, she worked at Napier Field in Dothan, Alabama. She conducted solo flights to test AT-6 planes that had been repaired, and she ferried planes from Napier to other United States bases. Then she worked as an instructor for flight cadets.

The WASP at Napier Field were lucky because the commanding officer there welcomed them. They ate meals in the officers' mess (dining hall) and lived in the nurses' dormitories. However, officers at some of the other bases resented women pilots and did not welcome them. On some bases, women even had to provide their own places to live.

WASP pilots take off on a target-towing mission at Camp Davis, Pender County. *Courtesy of North Carolina State Archives.*

Adams met her husband while working at Napier Field. One day, just as she was landing, a severe dust storm hit the landing field. A strong crosswind gust caused her plane to nose up and drag a wingtip. Other cadets were trying to land, and she was afraid that because of the poor visibility in the dust storm, one might land on top of her. After the dust had cleared, an officer came to check out her accident. Later she recalled that when she took off her goggles, she "looked like a clown with two white spots around my eyes and everything else covered with dust." Things worked out, though, because she later married the officer she met that day on the airstrip. When talking about that stormy day they met, she said, "He was the silver lining in that dark cloud."

After the war, Adams and her husband, Robert, lived in Houston, Texas, for fifty-four years. They raised their son and daughter there, and Adams was active in her church and volunteered for various charities. When her husband died in 1999, she came back to live in Durham. When asked about her experiences with the WASP, Adams said, "I loved every second of it."

In the 1970s, soon after their thirtieth reunion, WASP veterans were very excited to hear that the navy was training a small group of women to be military pilots. But media reports stated that this would be the first time women had flown military aircraft. As Adams said, "The WASP got their stingers out!" Their story had never been told. For thirty years, the government had kept their records sealed, and not many Americans knew of their contributions. So the WASP began to publicize their World War II service. Kate Adams did her part. She gave interviews, spoke to interested groups, and continued to attend annual WASP reunions. Adams also donated her uniform and related photographs to the North Carolina Museum of History. By the time she died in 2002 at the age of eighty-three, the WASP had begun to achieve more public recognition for their service during World War II.

WASP pilots at Camp Davis, ca. World War II. *Courtesy of North Carolina State Archives.*

Tar Heels in Space

*by Jim Sumner**

Barely a half century after the Wright brothers' first flight, people were flying in outer space. Numerous North Carolinians have played important roles in this ongoing effort to explore the "final frontier."

Astronaut Scott Carpenter prepares for his Project Mercury flight in 1962 in Chapel Hill as fellow astronaut Walter Schirra *(center)* and planetarium instructor Dr. James Batten *(left)* look on. *Courtesy of Morehead Planetarium and Science Center.*

The United States became serious about space flight in the years after World War II. The country's earliest efforts took place under the control of the Department of Defense and the National Advisory Committee for Aeronautics. Space was regarded as part of the cold war between the United States and the Soviet Union. Most Americans in the 1950s were convinced of their country's technological superiority. That belief was shaken badly on October 4, 1957, when the Soviet Union launched *Sputnik,* the world's first satellite. The following year, the United States responded by establishing the National Aeronautics and Space Administration to oversee its space efforts. This organization is known by its initials, NASA.

On February 14, 1961, Granville County native James Edwin Webb became the second administrator of NASA. Three months later, President John F. Kennedy announced, "I believe that this nation should commit itself to achieving the goal, before this decade is out, of landing a man on the Moon and returning him safely to Earth." The so-called space race to the moon became a national priority, and James Webb's job became very important.

Webb was a native of Tally Ho, North Carolina. His father was superintendent of the Granville County public schools. James Webb graduated from the University of North Carolina at Chapel Hill in 1928. At various times, he was a marine, a lawyer, a business executive, and a government official in Washington. Webb knew how to run an organization, create support for the space program, and obtain money from Congress. Under his leadership, NASA first sent Americans into space in the Mercury and Gemini programs in the 1960s. NASA also began the Apollo program, which would win the space race and send astronauts to the moon in 1969. Webb also instituted a vigorous program of unmanned space-science launches.

James E. Webb *(right)* presents former president Harry S. Truman with rocket models for his new presidential library during a tour of NASA's new headquarters in Washington, D.C., on November 3, 1961. *Courtesy of National Aeronautics and Space Administration.*

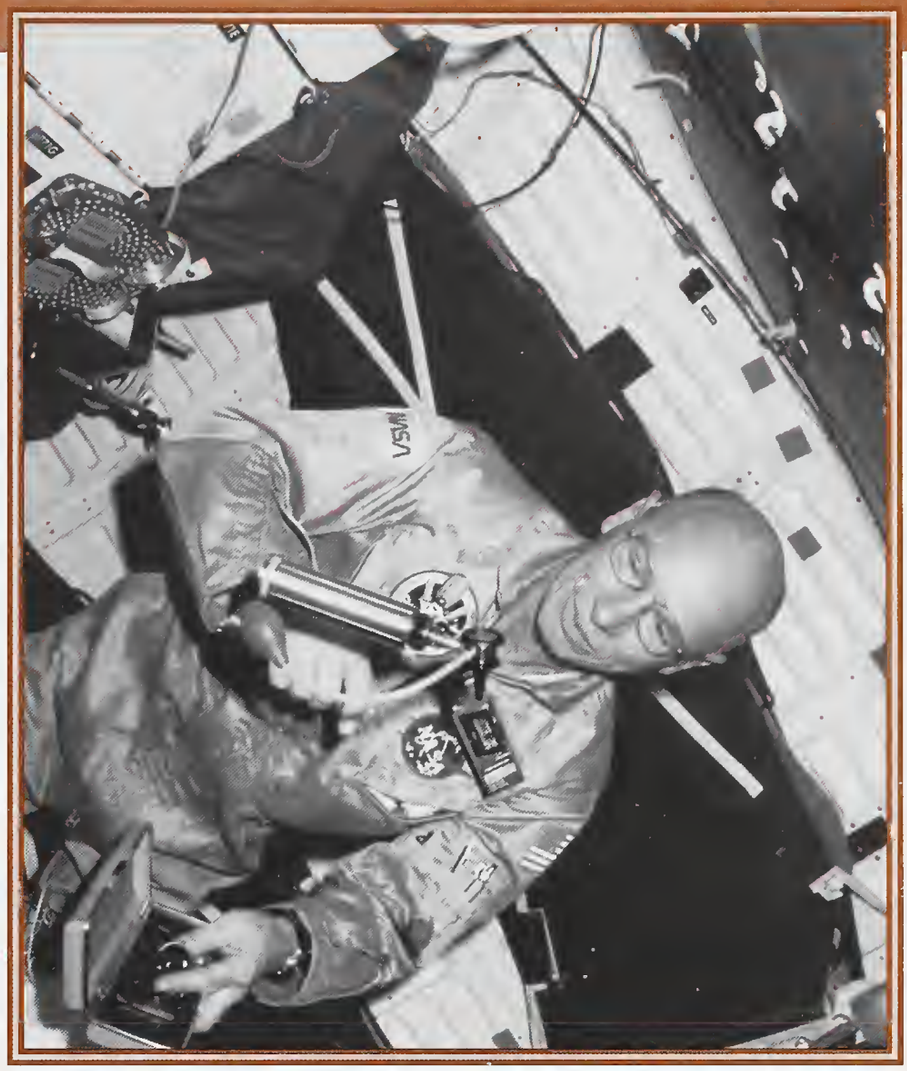
**Jim Sumner is the curator of sports and a research historian at the North Carolina Museum of History. He also served on the* Pioneers of Aviation *Exhibit Team.*

On January 27, 1967, astronauts Virgil "Gus" Grissom, Edward White, and Roger Chaffee were killed in a fire on the ground while conducting experiments in an Apollo capsule. Webb said, "We've always known that something like this was going to happen sooner or later. . . . Who would have thought that the first tragedy would be on the ground?" Webb worked with NASA and Congress to find out what went wrong. He absorbed much of the criticism himself and left NASA in 1968. Historians give Webb high marks for his leadership. In 2002 NASA announced that it would name a future space-based observatory the James Webb Space Telescope.

James Webb never came close to going into space. But several North Carolinians have.

Charles Duke was born in Charlotte in 1935 and grew up in Lancaster, South Carolina. He commanded the lunar module for *Apollo 16*. Duke walked on the moon in April 1972. He is one of only twelve people who have walked on the lunar surface.

A number of more recent astronauts grew up in North Carolina and consider this their home state. These men all flew in one of the space shuttles, the reusable space vehicles that were first launched in 1981.



Dr. William Thornton on the STS-8 *Challenger* flight in 1983. He says that "instruments don't fall and break in space; they float away and hide." Here Dr. Thornton is opening an oto-ophthalmoscope case. *Courtesy of Dr. William Thornton.*

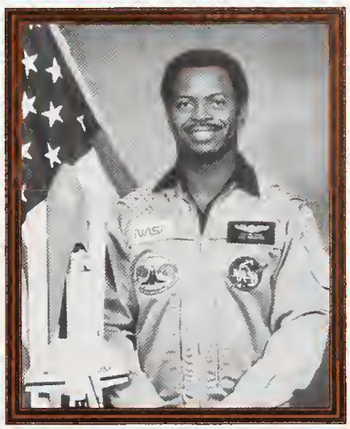
Curtis Brown grew up in Elizabethtown, Bladen County, before training as an air force pilot. He became an astronaut in 1988 and flew on six space shuttle missions between 1992 and 1999. Brown has spent fifty-eight days in space. In 1999 he served as a crew member on a flight that upgraded the Hubble Space Telescope.

Dr. William Edgar Thornton, from Faison, Duplin County, was the first North Carolina astronaut selected by NASA. While at NASA, Dr. Thornton made a number of discoveries, often with equipment that he designed. He flew his own medical lab on *Challenger* in 1983, when the shuttle made its first night launch. He went into space again with the first animal study in 1985 and retired from NASA in 1994.

William "Bill" McArthur grew up in Robeson County. He became a United States Army aviator, and he went into space in 1993, 1995, and 2000. McArthur was in space for thirty-five days altogether and spent thirteen hours outside the shuttle, performing experiments. His 1995 mission involved docking with the Russian space station *Mir*.

Charles Brady was born in Pinehurst, Moore County, and grew up in nearby Robbins. He graduated from the University of North Carolina at Chapel Hill and Duke University Medical School. Dr. Brady became an astronaut in 1992. He flew on space shuttle mission STS-78 in 1996, logging more than four hundred hours in space.

On January 28, 1986, the space shuttle *Challenger* exploded on liftoff, killing all seven crew members. The pilot, Michael Smith, was a native of Beaufort, Carteret County, and was on his first space flight.



Michael J. Smith *(left)* and Dr. Ronald E. McNair *(right)*. *Courtesy of National Aeronautics and Space Administration.*

He carried a North Carolina flag with him. Also on the *Challenger* was Ronald McNair, a South Carolina native who had graduated from North Carolina A&T State University. Dr. McNair had been in space in 1984 and was an engineer. His job was to conduct scientific experiments. There were no North Carolinians on the shuttle *Columbia* when it burned up upon reentry on February 1, 2003.

North Carolina Space Grant Consortium. The consortium was established in 1991 to coordinate space research in the state. North Carolina State University and North Carolina A&T State University became the first two members. They have been joined by Duke University, North Carolina Central University, the University of North Carolina at Charlotte, Winston-Salem State

The HL-20 Space Taxi at North Carolina State University in September 1990. *Courtesy of North Carolina State University.*

Not all of North Carolina's contributions to space exploration have been made by Tar Heels who went into space. Most United States astronauts in the 1960s trained at Morehead Planetarium on the campus of the University of North Carolina at Chapel Hill. There they learned celestial navigation, or how to navigate in space by looking at stars.

More recently, North Carolina State University's Mars Mission Research Center has conducted research on proposed future trips to Mars. The Mars Mission Research Center is now part of the University, the University of North Carolina at Chapel Hill, and the University of North Carolina at Pembroke.

North Carolina astronauts, administrators, and scientists are just some of the contributions this state has made to the space program. These contributions will continue, as the human race continues to expand its presence in outer space.

Lindbergh stands beside his plane, the *Spirit of St. Louis*, at Lambert Field in Saint Louis, Missouri, en route to New York and the takeoff of his solo, nonstop transatlantic flight. *Photograph, 1927. Copyright 2000, Missouri Historical Society, Saint Louis, Missouri.*

Lindbergh's Influence on Aviation

by RoAnn Bishop*

Before Charles Lindbergh made the first solo, nonstop flight across the Atlantic Ocean in May 1927, most Americans—including many North Carolinians—thought it too dangerous to travel by airplane. Two United States Army pilots had made a nonstop transcontinental flight in 1923, and navy commander Richard Byrd had flown over the North Pole in 1926. But the average citizen in 1927 still preferred to do his or her traveling by car, ship, or train.

Lindbergh's flight changed that. When the twenty-five-year-old former airmail pilot safely landed his plane, the *Spirit of St. Louis*, at Le Bourget Field near Paris, France, after a 33½-hour flight from Long Island, New York, on May 20–21, 1927, Americans gained a new confidence in air travel. Suddenly, everybody wanted to fly. In 1929 more than 170,000 paying passengers boarded United States airliners—nearly three times the 60,000 that had flown the previous year. Almost 3 million more—most of them businesspeople—traveled in private planes in 1929. Even Mickey Mouse took to the air, mimicking Lindbergh's flight in the 1928 Walt Disney cartoon *Plane Crazy*.

*RoAnn Bishop is an associate curator at the North Carolina Museum of History. She served on the Lindbergh Exhibit Team at the museum.

Lindbergh circled over Greensboro several times in the *Spirit of St. Louis* before landing—right on schedule—at Lindley Field on October 14, 1927. Lindbergh's visit to Greensboro and to Winston-Salem on October 14–15, 1927, was part of his postflight tour of the United States to promote aviation. *Courtesy of North Carolina State Archives.*

Because of Lindbergh's flight, aviation stocks soared. For a short time, even the stock of a small eastern company called Seaboard Airline saw activity—until it was discovered that the corporation was actually a railroad. As financial investors came forward, more and more fledgling airlines began to emerge. By the end of the 1920s, there were forty-four scheduled United States airlines, and many nonscheduled ones. Commercial airplanes began serving Raleigh in September 1929. One line flew passengers to New York, and another offered service to Charlotte and Atlanta. A Richmond-to-Atlanta flight soon began making stops in Greensboro and Charlotte, and one from Richmond to Jacksonville, Florida, made stops in Raleigh.

Lindbergh *(right)* and Winston-Salem mayor Tom Barber stand beside the *Spirit of St. Louis* during the aviator's October 14, 1927, visit. While in Winston-Salem, Lindbergh dedicated Miller Municipal Airport, addressed students at Hanes Park, and attended a banquet in his honor. *Courtesy of the Forsyth County Public Library.*

After his transatlantic flight, Charles Lindbergh used his fame to promote the development of aviation. At the request of the Guggenheim Fund for the Promotion of Aeronautics, Lindbergh toured the United States in the *Spirit of St. Louis* during the summer and fall of 1927. Traveling a total of 22,350 miles, he visited seventy-five cities and dropped messages over towns where he couldn't stop. In North Carolina, Lindbergh visited Greensboro and Winston-Salem on October 14–15, 1927, and dropped messages over Salisbury and Lexington.

To prepare for Lindbergh's visits, cities across the nation groomed their airports, and those without facilities built them. Greensboro's Lindley Field, later to become the Piedmont Triad International Airport, was dedicated in May 1927, just five months before Lindbergh landed there. Regular airmail service began at the airport the following year, and regular commercial air passenger service from Greensboro to Washington, D.C., started in 1930. Inspired by Lindbergh and local aviation pioneers Dick and Zachary Smith Reynolds, Winston-Salem also began its airport in 1927. Clint Miller gave the materials, grading work, and his name to Miller Municipal Airport, which Lindbergh helped to dedicate during his visit to the city. The airport would later be renamed Smith Reynolds Airport in memory of Z. Smith Reynolds, who became the nation's youngest licensed pilot at age nineteen and died at the age of twenty-one.

Among the crowd listening to Lindbergh's speech at the dedication of Miller Municipal Airport in 1927 was nine-year-old Thomas H. "Tom" Davis. Inspired by Lindbergh's words, Davis decided to pursue a career in aviation. He earned his pilot's license at age sixteen and founded Piedmont Airlines in 1947, at the age of twenty-nine. The North Carolina–based airline became the nation's seventh largest before merging with USAir in the late 1980s.

While young Davis was listening to Lindbergh in Winston-Salem, another nine-year-old boy, Robert Morgan of Asheville, was following Lindbergh's national tour in the newspapers and clipping articles about it to keep in his scrapbook.

During World War II, Morgan became the pilot of the famous *Memphis Belle*, the first B-17 bomber to complete twenty-five missions over Europe—and without losing any crew members.

Another North Carolinian, William A. "Bill" Winston of Wendell, became a minor celebrity after Lindbergh's flight, when the media learned that he was the Army Air Service sergeant who had given Lindbergh his first "official" flying lessons, at Brooks Field in Texas in 1924. Lindbergh even wrote about Winston in *WE*, the 1927 autobiographical book about his famous flight. Winston later became a master pilot for Pan American World Airways and was one of the first American pilots to make more than a hundred transatlantic flights.

Army Air Service master sergeant Bill Winston of Wendell gave Lindbergh his first official flying lessons at Brooks Field, Texas, in April 1924, when Lindbergh was a cadet. Lindbergh later wrote, "I had been particularly fortunate in my assignment of an instructor." *Courtesy of Tom and Jan Broadfoot.*

A collage of items that Lindbergh carried on his New York-to-Paris flight includes a canteen, pilot's license, passport, leather notebook, flashlight, and bottle of oil for the *Spirit of St. Louis*. *Photograph by Cary Horton. Copyright 2002, Missouri Historical Society, Saint Louis, Missouri.*

Immediately after Lindbergh's transatlantic flight, newspapers began comparing it to the Wright brothers' first flight at Kill Devil Hill in 1903. The attention sparked an effort to establish a national memorial to the brothers. Secretary of the Navy Josephus Daniels, a North Carolinian, had first raised the issue in 1913. Fourteen years later, Congress passed a bill authorizing the Wright memorial. Orville Wright was present at the laying of the cornerstone in 1928, but Lindbergh was not. The young aviator had been invited to attend the ceremony but reportedly declined at the last minute, not wanting to detract any attention from Orville and his accomplishment.

Lindbergh continued to influence aviation throughout his life. In 1931, with his wife, Anne Morrow Lindbergh, serving as copilot and navigator, Lindbergh charted international air routes for new commercial airlines flying across Canada to Asia. Two years later, the Lindberghs flew 30,000 miles mapping out commercial routes across the Atlantic. During World War II, Lindbergh worked with Ford Motor Company as a consultant on B-24 bomber production and then served as a technical adviser and test pilot for United Aircraft. Later, he went to the South Pacific to study fighter planes' capabilities and to teach pilots how to conserve their fuel so they could increase their bombing range. As a civilian adviser in the Pacific theater, Lindbergh actually flew about fifty combat missions. On at least one sortie, he shot down a Japanese plane.

Seventy-six years after his famous transatlantic flight, North Carolinians still have reason to remember and to celebrate Lindbergh. To learn more about the man, his flight, and his legend, visit *Lindbergh*, a traveling exhibit produced by the Missouri Historical Society. It will be at the North Carolina Museum of History in Raleigh from November 8, 2003, to February 1, 2004.

"The Greatest Pilot on Earth"

by Dr. Thomas C. Parramore

Sampson County's Belvin Maynard was once known across America as "the greatest pilot on earth." Towns and clubs begged him for appearances, and honors poured in daily.

Never heard of him? You've got company. Today he is all but forgotten, even in North Carolina. How could such a gifted aviator almost vanish from history?

Maynard was born in Anson County and grew up on a Sampson County farm. In school he played baseball and was in the band, the debating club, and a singing quartet. At home he became an expert mechanic and kept the farm machinery repaired; he could take a car apart and rebuild it. But he hoped to become a preacher, so in 1913 he went to Wake Forest College for ministerial study. Now having a wife and child, he did odd jobs but soon had to leave school to find better-paying work.

Maynard with his plane, *Hello Frisco*, a de Havilland DH-4.

When America entered World War I in 1917, Maynard joined the army and learned to fly, spending the next year testing new planes at a French airfield. The army found him too valuable there to send him to the front lines. Maynard had learned so much about flying many types of aircraft that he had become indispensable in his testing role. When the war ended in late 1918, Maynard, waiting to go home, spent the winter testing airplanes. For recreation he sometimes flew stunts, dazzling big crowds. He even broke a world record by doing 318 loops in sixty-seven minutes.

Returning home the next summer, Maynard was soon back at Wake Forest. But as classes began, he was invited to fly in an air race from Long Island, New York, to Toronto, Canada, and back—a distance of more than one thousand miles, the longest air race ever held. It was billed as "the greatest air race in history." Maynard would fly a de Havilland biplane. The race took place in October 1919, and he won, beating some of the world's best flyers.

Newspapers called him the Flying Parson and "the greatest pilot on earth." In North Carolina, he was a conquering hero. The race showed that airplanes, evolving from the rickety stick-and-cloth machines of prewar days into mankind's fastest means of travel, would bring huge changes, with Maynard leading the way.

He had resumed classes at Wake Forest when he was invited to participate in another race, one that made the New York–Toronto one seem timid. It would cover some six thousand miles, from Long Island to San Francisco. Its sixty-seven planes would land at certain points for fuel and rest. (Only flying time counted in picking the winner.) With Maynard were his puppy, Trixie (wearing a Snoopy-style scarf), and his mechanic, William Klein. Their de Havilland was named *Hello Frisco.*

Maynard avoided bumpy cloud banks that forced some planes down early in the race, and he reached San Francisco in first place. After a brief stay, he set off for New York, confident that he would win. But the next day, near Omaha, Nebraska, his motor stopped. He had to land in a rural cornfield. Klein found the camshaft broken.

An artist's rendering shows Maynard and his mechanic, William E. Klein, changing motors overnight in a field in Wahoo, Nebraska. *Courtesy Caralee Maynard Rooks.*

The chance at victory vanished, because the nearest new motor was in Chicago, some five hundred miles east. The motor could not be replaced in time to win the race.

Maynard reviewed his problem and thought of a possible rescue. He had heard in San Francisco that a rival pilot, using the same kind of motor, had crash-landed in Nebraska. If the other downed plane was close enough, and if the motor could still run, it could replace Maynard's and get him back in the race.

Maynard ran to a farmhouse and called an Omaha army base. He learned that the wreck was eleven miles away and that soldiers were removing the plane's undamaged motor. He borrowed an army truck and sped to the wreck, telling the workers to rush the motor to his plane. When Maynard returned to *Hello Frisco*, Klein was removing the broken motor. The new one soon arrived and was installed. Maynard took off at dawn, still with a chance of winning. Two days later, he did.

Maynard, still in the army, was the toast of America. He was celebrated at a New York City parade. He was recommended for promotion and other honors. Newspapers were full of praise, and Washington, D.C.'s, Smithsonian Institution displayed a replica of *Hello Frisco* Tar Heels were thrilled.

Maynard's fame as "the greatest pilot on earth" lasted just a month. In a November talk to an antiliquor group, he said that some pilots in the recent race had been drunk. The army insisted that the racers had been checked at all stops, and that none were intoxicated. There was talk of court-martialing Maynard. By Christmas his reputation was ruined. He left the army and began stunt flying. In a Vermont air show in 1922, he crashed and died, bringing a tragic end to a grand career.

TAR HEEL AVIATOR LEADS IN TRANS-CONTINENTAL FLIGHT FROM ATLANTIC TO PACIFIC

Lieut. B. W. Maynard, of Wake Forest College, Lands in Chicago in Record Time

AVERAGED TWO MILES MINUTE WHILE FLYING

Theological Student Who Won Toronto - New York Aerial Race Swings Through 840 Miles of Space in Single Day; Slated For Honors By American Flying Club, He Remains With Machine Instead and Did Not Attend Banquet Arranged For Him; German Police Dog and One Passenger Make Journey With Him

WAKE FOREST BOY LEADS IN FLYING

LIEUT. B. W. MAYNARD, of Kerr, N. C.

THREE KILLED IN AIRPLANE CONTEST

Lieut. B. W. Maynard Leads in Race Between Forty-Seven Entries

BLAZE TRAIL ACROSS CONTINENT AND RETURN

The Raleigh *News and Observer* reported the results of the first transcontinental airplane race in a series of articles in October 1919. *Courtesy of the State Library of North Carolina.*

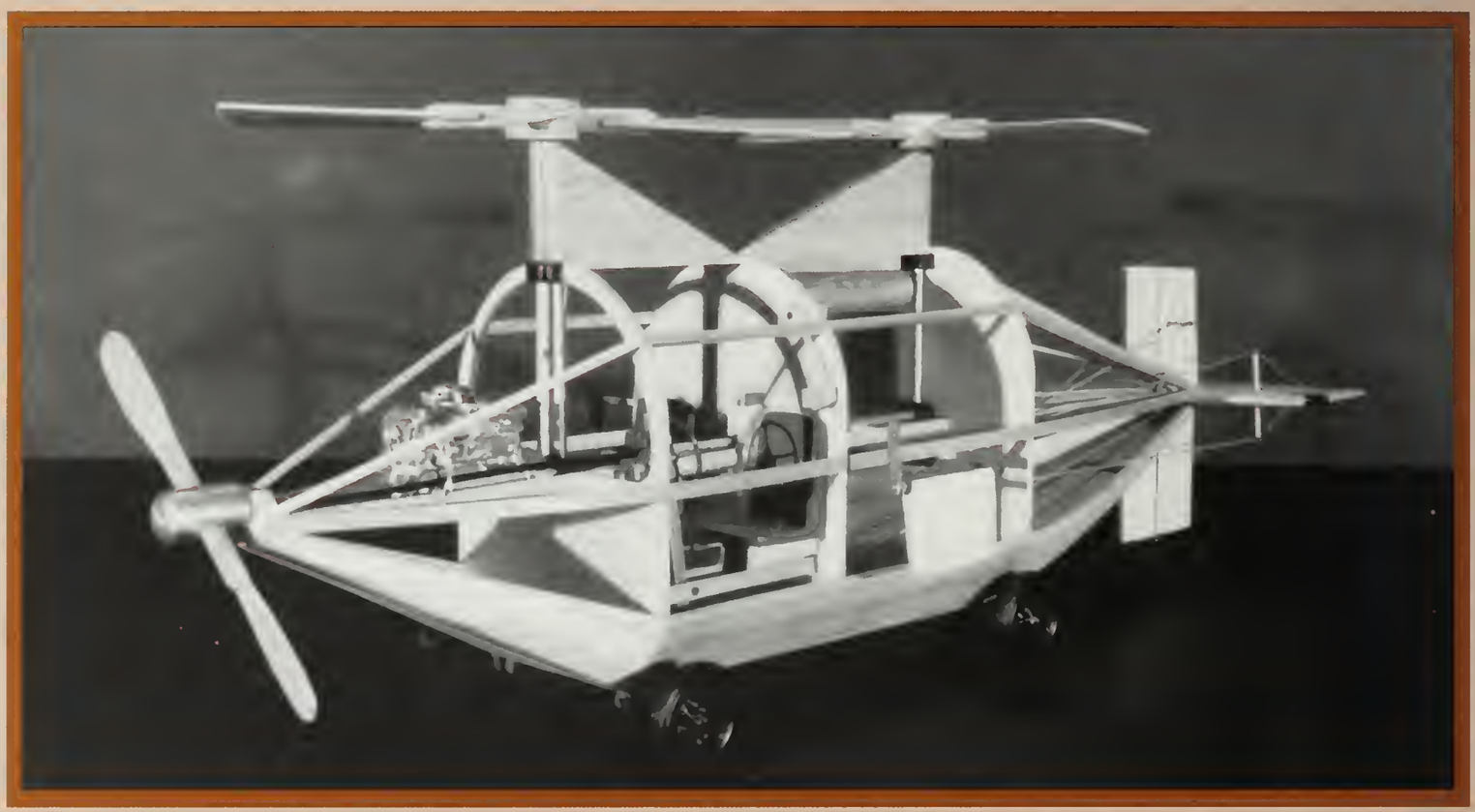
Flight of the Imagination

by Rebecca Lewis

Have you ever heard the phrases "flight of fancy" and "flight of the imagination"? Imagination is an important aspect of flight. The Wright brothers studied birds and dreamed of flying. They made that dream a reality with hard work and experimentation, but imagination created the idea and provided the inspiration. In North Carolina, others have invented their own winged contraptions.

Wright brothers were testing their flyer, Paul was experimenting with his *Bumble Bee*, a compound helicopter. Powered by an engine that Paul had made from four motorcycle engines bolted together, the machine had two four-blade rotors on top for vertical lift and a pulling propeller for forward flight.

Paul tested his helicopter in an open-ended barn that functioned as a wind tunnel. In 1907 the



Scale model of the *Bumble Bee*. *Courtesy of Grayden M. Paul.*

Thomas Edison said that flying would never be practical "until someone invents a machine that can stop in midair and hover like a bird." The machine that allows a pilot this degree of control is a helicopter. And the first person to develop a working helicopter came from Carteret County.

William Luther Paul was known in his hometown of Davis as Mr. Fixit. This talented handyman made his own laborsaving tools for every use imaginable. In 1903, around the time that the

Bumble Bee lifted about five feet while tethered to the ground and carrying sixty pounds of sandbags. There were several eyewitnesses. Paul planned to test it with himself as the pilot, but after his wife read about a fatal plane crash, she begged him not to continue the experiments. Paul abandoned his project, without any tangible proof of its success.

Another rotary-type flyer, the gyrocopter, was built by Igor Bensen of Raleigh. Bensen was born on April 1, 1917, in Rostov, Russia. He enrolled at

Stevens Institute of Technology in New Jersey in the late 1930s. In 1939 Bensen took a summer job with Igor Sikorsky, generally recognized as the father of the modern helicopter. After working for Sikorsky, Bensen was a research scientist at General Electric before starting his own company, Bensen Aircraft Corporation, near Raleigh-Durham Airport.

Bensen began building gyrocopters in 1953. In a gyrocopter, no power is used to turn the overhead blade. Instead, the engine powers a pusher propeller that drives the machine forward. As the gyrocopter picks up speed, increased airflow through the top rotor causes it to spin and creates lift. If the engine loses power, the overhead blades rotate on their own, and the machine floats down like a parachute.

This Bensen Model B-8M gyrocopter "hovers" over the lobby of the North Carolina Museum of History in Raleigh.

Bensen wanted to mass-produce a "people's flying machine," so he designed his craft to be simple to assemble and operate, and inexpensive. Thirty dollars bought plans for a gyrocopter, and $1,795 would buy a kit. Bensen sold around ten thousand kits. His clients included diamond prospectors in the Amazon, crop dusters in the United States, and James Bond! In the 1967 movie *You Only Live Twice*, Bond piloted a highly modified gyrocopter that he called *Little Nellie*. The rocket launchers and smoke screens used in the movie did not come as standard features in the gyrocopter kits.

Bensen demonstrates how easy it is to pilot a gyrocopter by flying one with no hands.

The Bensen gyrocopter was a highly maneuverable machine. Bensen set world records for speed (79 mph), altitude (7,275 feet), and distance (82.76 miles) in a gyrocopter named *Spirit of Kitty Hawk*. The Bensen Aircraft Corporation closed in 1989, but one of Bensen's gyrocopters remains on permanent display at the North Carolina Museum of History in Raleigh.

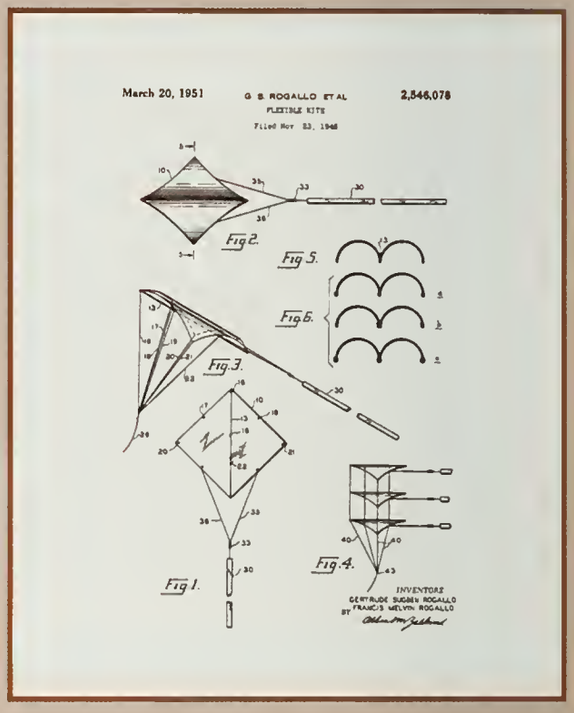
Another scientist who wanted to make flight possible for everyone is Francis M. Rogallo. Rogallo had joined the National Advisory Committee for Aeronautics (NACA), the forerunner of NASA, in 1936. He wanted desperately to fly a plane, but he never had the opportunity. So he began to think of other ways to fly. He devoted himself to designing a flexible wing—one could be applied to man-carrying devices such as gliders. With the help of his wife, Gertrude, Rogallo built a wind tunnel at home and began testing wing models. In 1951 the Rogallos received a patent for a flexible delta-shaped (triangular) wing. The prototype of today's hang gliders was made from one of Gertrude's kitchen curtains!

After receiving a patent on the flexible wing, the Rogallos tried to interest government and industry in their design but were unsuccessful. Instead, they

Rogallo tests an early flex-wing kite with his daughter Carol in 1950.
Courtesy of the Rogallo Foundation.

began producing flexible-wing kites as children's toys. The Rogallo Flexible Wing Flyer was one of the first products to use the plastic Mylar. Unlike standard kites, it could crash multiple times and not be damaged. The toy kites were great, but Francis Rogallo was still determined to fly, so a full-scale version was needed.

The first full-scale, flexible-wing hang gliders were built for the Rogallos by a man who owned a clothing factory. The entire Rogallo family—Francis, Gertrude, and their four children—began flying the gliders in the sand dunes of the Outer Banks. The sport of hang gliding really took off in the early 1970s. Today hang gliding events occur at places like Jockey's Ridge and Grandfather Mountain. Hang gliding enthusiasts everywhere honor the "father of hang gliding," Francis Rogallo.



Technical drawings used in the patent application for the Rogallo flex-wing. The patent, which was granted in 1951, specified that the "flexible kite" could carry people.
Courtesy of the Rogallo Foundation.

NASA, then known as NACA, took notice of Rogallo's invention in 1957 after Russia launched the *Sputnik* satellite. Suddenly, the flexible wing had potential as a possible reentry tool for America's rockets. NASA began conducting experiments with the gliders, the results of which were published in technical journals such as *Popular Mechanics*. One of these reports attracted the attention of engineer Thomas Purcell.

The sport of hang gliding originated from Rogallo's flexible-wing design.
Courtesy of the North Carolina Division of Tourism, Film, and Sports Development.

Purcell studied engineering at North Carolina State University. In 1961 Purcell, using photographs of Rogallo's design from a magazine article, constructed a sixteen-foot-wide glider with an aluminum frame that he tested by towing it behind an automobile at the Raleigh-Durham Airport. Purcell called Rogallo one day, and the two engineers agreed to meet.

When Purcell arrived at NASA, he was surprised to find himself surrounded by engineers

Purcell piloting his FlightSail at Gresham's Lake in 1964.

who were asking numerous questions about his FlightSail glider. Purcell had figured out how to do something that NASA had not—achieve stability in a towed glider. He continued to work on his glider. He replaced the wheels with floats for towing it behind a speedboat. He flew the pontoon glider for the first time at Lake Waccamaw on July 26, 1962. It worked so well that he never went back to land-based liftoffs again. This was the first water-based use of the Rogallo wing.

Innovations in aviation continue. To see the future of aviation, visit the NASA Web site at http://www.nasa.gov. Today NASA and private research companies search for ways to make aeronautical travel safer and more efficient. Aviation has come a long way in one hundred years, but there are many engineers and scientists who believe the quest for flight has just begun. Where will we go next? Will you be the one to take us there?

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